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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,894	03/23/2004	Larry S. Eoff	2001-IP-005267U1P2	2392

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EXAMINER	
FIGUEROA, JOHN J	

ART UNIT	PAPER NUMBER
1796	

NOTIFICATION DATE	DELIVERY MODE
10/05/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/806,894	EOFF ET AL.	
	Examiner	Art Unit	
	John J. Figueroa	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5 and 7-38* is/are pending in the application.

4a) Of the above claim(s) *11-38* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5 and 7-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :04/19/2010; 06/23/2010; 07/08/2010; 08/02/2010; and 09/21/2010
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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. Receipt is acknowledged of a request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e) and a submission (amendment), filed on June 23, 2010. This request has been deemed proper and this application has been hereby examined in view of said amendment.

Response to Amendment

2. The 35 U.S.C. §102(b) rejection of claims 1, 3 and 5-10 as anticipated by USPN 3,271,307 to Dickson et al. (hereinafter 'Dickson') previously made of record in item 6 on page 3 of the Final Office Action dated April 1, 2010 (hereinafter 'FOA') has been withdrawn in view of Applicant's amendment to independent claim 1 (submitted with the response to FOA filed with RCE on June 23, 2010, hereinafter 'Response'), which limits the polymer backbone of the hydrophilic polymer to have at least one polar heteroatom that is not nitrogen.

Election/Restrictions

3. A restriction/election of species requirement had been previously presented in items 1-8 on pages 2-5 of the Office Action dated July 3, 2006. Applicant had elected therein (item 8 on page 5), *inter alia*, chitosan as the species for the hydrophilic polymer

and alkyl halide as the species for the hydrophobic compound. However, in the previous response, Applicant amended the hydrophobic compound in independent claim 1 by limiting the hydrophobic compound to sulfate; sulfonate; and organic acid derivatives, and deleted alkyl halide as a species from dependent claim 6. Accordingly, Applicant had constructively elected, for examination, sulfate; sulfonate; and organic acid derivative as species for the hydrophobic compound. This requirement had been made final in a prior office action.

4. Examiner notes that currently in Response, Applicant has reintroduced alkyl halide as a species for the hydrophobic compound in independent claim 1. For purposes of the instant action, alkyl halide has been treated as a non-elected species for the hydrophobic compound.

5. Accordingly, claims 1-3, 5 and 7-10 have been examined in the instant action and claims 11-38 remain withdrawn from consideration.

Claim Rejections - 35 USC § 102

6. **The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.**

7. Claims 1-3, 5 and 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application Publication No. 2003/0013871 A1 to Mallon et al. (hereinafter 'Mallon').

This rejection has been reintroduced and addresses elected species for the hydrophilic polymer (chitosan) but non-elected species for the hydrophobic compound (alkyl halide).

As discussed previously in prior actions, Mallon discloses preparing a modified cellulose/polysaccharide ether by subjecting the cellulose ether sodium salt to electrodialysis and reacting with a base or salt to form a product that has few impurities and is thereby low polluting; wherein the base or salt can be, e.g., a chloride of up to thee carbons; and wherein the polysaccharide starting material can be chitosan or chitin (oxygen and nitrogen atoms in backbone). (Page 1, [0004] to [0008] and [0018]; page 2, [0024]; page 4, [0060]) The molecular weight for the polysaccharide is between 10,000 and 2 million grams/mol (page 4, [0061]) and a particular derivatizing agent for modifying the polysaccharide are alkyl halides, such as ethyl chloride or methyl chloride (page 4, [0062]).

Mallon further discloses a typical industrial application for the polysaccharide ether are oil field drilling and fracturing processes, wherein the modified polysaccharide can serve as a viscosity adjuster or suspension aid (page 6, [0076]) and wherein said polysaccharide can be present in a composition from about 0.05 to 3% by weight (page 6, [0080]). Accordingly, because Mallon is disclosing adding to a drilling process the same compound (alkylated chitosan) as the elected species for the hydrophobically-modified polymer recited in the claims (which would, of course, inherently have the same physical properties), Mallon is thereby disclosing a method of drilling in a

subterranean formation by adding an RPM polymer compound in accordance with the instant claims with sufficient specificity.

Although Mallon may not explicitly disclose "allowing" the relative permeability modifier to "attach" onto the surface, because Mallon discloses treating a formation with the same relative permeability modifier (RPM) polymer compound as encompassed by the instant claims (which would possess the same physical properties/effects), then the method of drilling disclosed in Mallon must inherently "allow" the RPM polymer compound to "attach" to a portion of the surface of the subterranean formation" upon the addition of said RPM polymer compound in Mallon's method of drilling in a formation.

Moreover, Mallon discloses particular derivatizing agents suitable for use in its method, such as alkyl halides or alkylene oxides, that can comprise from about 2 to 24 carbon atoms (preferably from about 2 to 5 carbon atoms per molecule), wherein the amount of ether substitution is typically from about 1.5 to 6 of ether substituent per mole of polysaccharide ether. (Page 4, [0062]) The polysaccharide ethers can be substituted with one or more desired cationic, anionic and/or *hydrophobic* substituents; wherein the *hydrophobic* substituent can comprise *alkyl*, alkylene, aryl-alkylene or aryl-alkyl groups having about 8 to 24 carbon atoms per molecule; and wherein the substitution level of each such substituent on the polysaccharide ether is typically from about 0.001 to 0.1 moles of substituent per mole of polysaccharide ether. (Page 4, [0063]) Mallon is thereby expressly disclosing its hydrophobically-modified water-soluble hydrophilic polymer (cellulose backbone/ether substituent) to be modified with an alkyl halide/oxide

compound having 8 to 24 carbons (thus, the resultant modified compound has an alkyl side chain having said number of carbons).

Thus, the instant claims, as currently amended, are anticipated by Mallon.

8. Claims 1-3, 5 and 7-10 are rejected under 35 U.S.C. 102(e) as anticipated by USPN 7,081,439 B2 to Sullivan et al. (hereinafter 'Sullivan').

Sullivan discloses a method of drilling/treating a subterranean formation including a step for pumping a colloidal suspension of small particles and an aqueous solution comprising a viscoelastic surfactant (VES) and a hydrophobically-modified polymer, wherein the hydrophobically-modified polymer is present at a concentration between approximately its overlap concentration and approximately entanglement concentration, and wherein the colloidal suspension and VES interact to form structures that effectively bridge and block pore throats. (Col. 2, line 43 to col. 3, line 6; col. 3, lines 41-61, particularly, lines 42-45; *see*, Figures 6 and 7 depicting a plot of the fluid loss mass as a function of time for blends comprising a VES, a hydrophobically-modified polymer and the fluid loss additive.)

Sullivan discloses that the VES can a cleavable viscoelastic surfactant having a head group (pendant) that can be amino ($NR_1R_2R_3$+) or, zwitterionic ($N(R_1R_2R_3$-COO) where R1, R2 and R3 are each independently hydrogen or a fully or partially saturated, linear or branched, aliphatic chain of at least one carbon atom, possibly comprising a hydroxyl terminal group. (Col. 4, lines 33-64) Further, the hydrophobic-modified polymer can be charged, is soluble in water and has an average molecular weight comprised between 10,000 and 10,000,000 g/mol, wherein said hydrophobically-

modified polymer has a principal backbone and, grafted on said principal backbone and pendant hydrophobic chains. (Col. 5, lines 26-51)

Sullivan further discloses that the principal polymer backbone can be a polysaccharide, or a synthetic polymer, such as poly(ethylene-graft-maleic anhydride); a polyacrylamide; a polyacrylate/polyacrylamide copolymer; or a polyamide. (Col. 5, line 52 to col. 6, line 2) The pendant hydrophobic chain can have 12-24 carbon atoms and can comprise amide groups and can include a cleavable or degradable group, such as an amide. (Col. 6, lines 3-11) The concentration of the polymer particles can be 0.1 to 0.5 by weight percent of the composition. (Claims 20 and 21)

A particular hydrophobically-modified polymer that Sullivan discloses as suitable for the aqueous treatment fluid is hydrophobically-modified chitosan (oxygen and nitrogen heteroatoms in backbone), wherein the polymer has undergone acylation, amination and/or alkylation to provide chitosan with cleavable hydrophobic side chains containing *organic acid derivative functionality*. (Col. 6, lines 12-27)

In Figures 1 and 2, Sullivan depicts results showing the enhance fluid-loss and permeability properties of the aqueous treatment fluid comprising VES and the hydrophobically-modified polymer in comparison with prior art fluid.

Thus, the instant claims, as amended, remain anticipated by Sullivan.

Response to Arguments

The 35 U.S.C. §102 Rejection over Dickson (item 6 on page 3 of OA)

9. Applicant's arguments in Response with respect to the 35 U.S.C. 102(b) rejection as anticipated by Dickson have been considered but deemed moot due to the withdrawal of this rejection in view of Applicant's current amendment to the claims in Response requiring the backbone of the polymer to contain oxygen and nitrogen heteroatoms. The polymers in Dickson contain solely nitrogen in its backbone.

The 35 U.S.C. §102 Rejection over Sullivan (item 7 on page 6 of OA)

10. Applicant's arguments in Response with respect to the 35 U.S.C. 102(e) rejection as anticipated by Sullivan have been fully considered but deemed unpersuasive.

Applicant's primary argument in Response is, apparently, that Sullivan does not discloses its polymer modified by a hydrophobic compound recited in claim 1. However, as discussed above and in item 7 of FOA, Sullivan does disclose its polymer comprising a hydrophobic branch containing an organic acid derivative functional group.

Thus, the present claims, as amended, remain anticipated by Sullivan.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Figueroa whose telephone number is (571)272-8916. The examiner can normally be reached on Monday-Thursday 8:00-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571) 272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John J. Figueroa /
Examiner, Art Unit 1796

JJF/JJS